

Geological History of Marginal Way Ogunquit, Maine
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All along the tourist walkway of Marginal Way Ogunquit, Maine one can expect to see lots of exposed rocks. These formations consist of two major rock types. The lighter colored one that makes up most of the bedrock, also known as the Kittery formation, and darker colored rocks that cut across the Kittery formation. These dark rocks, known as dyke intrusions, are the formation of focus. Our research project hoped to answer questions from both the community partners of Ogunquit, as well as contribute to the scientific discussion of the origin of the basalt dykes. Our research was collected with these two audiences in mind, and thus also focused on learning how to communicate our findings to the community.

Our challenge was to identify the age and origin of dyke intrusions. Past research suggests the basalt dykes could have come from one of three different geological events. The potential hypotheses are 1.) the Central Atlantic Magmatic Province "CAMP," which initiated the spreading of the Atlantic Ocean about 200 million years ago 2.) the Coastal New England Series "CNE," a geological event prior to the splitting of Pangea or 3.) the basalts formed from a series of hotspots much like the ones that formed Hawaii. There is lots of geological information surrounding CAMP, but less about CNE or the New England hotspots, so by discovering if these dykes were a part of CNE we would be able to provide more data and link the geological events together.

Our initial hypothesis was that we would find compositional data that suggests the presence of dykes came from both CAMP and CNE. We went out into the field and collected rock samples from five different basalt dykes and collected structural measurements of their orientations. Two processes that can affect the chemistry of these rocks are weathering and fluid alteration. As we conducted our research we worried about weathering and the quality of the rocks. Under the SEM microscope we learned that most of the samples were chloritized or albitized (a secondhand alteration of the composition of the rock). It was challenging to find samples not affected, which is part of what makes this area challenging to study. However, by focusing on some of the more pristine minerals in the rock we were able to collect some data most likely from the original composition of the minerals.

Despite these alterations, 4 out of our 5 samples trend towards CNE data, and one sample trends towards CAMP. This is an important finding because not only does it rule out the New England Hotspots, but that Marginal Way has the presence of rocks from both CAMP and CNE.



Photo of dark rock (dyke intrusions) cutting across the lighter rock (Kittery formation) at Marginal Way Ogunquit, Maine

Mentor Emily Peterman

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Commented [CG1]: Different

Commented [CG2]: This part is cool because it mentions what our original contribution to earth science in Maine will be

Commented [CG3]: Good job mentioning the initial hypothesis

